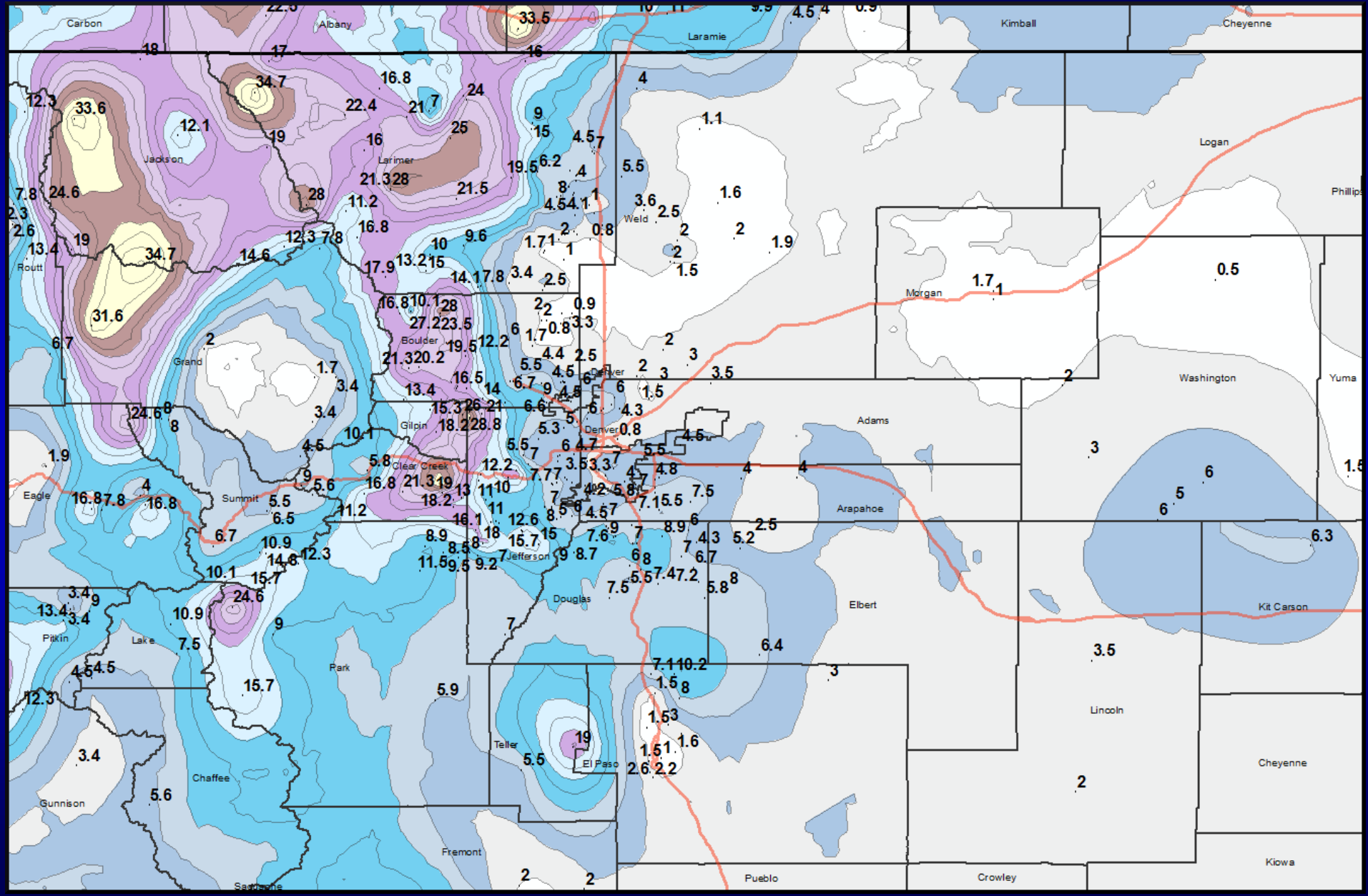
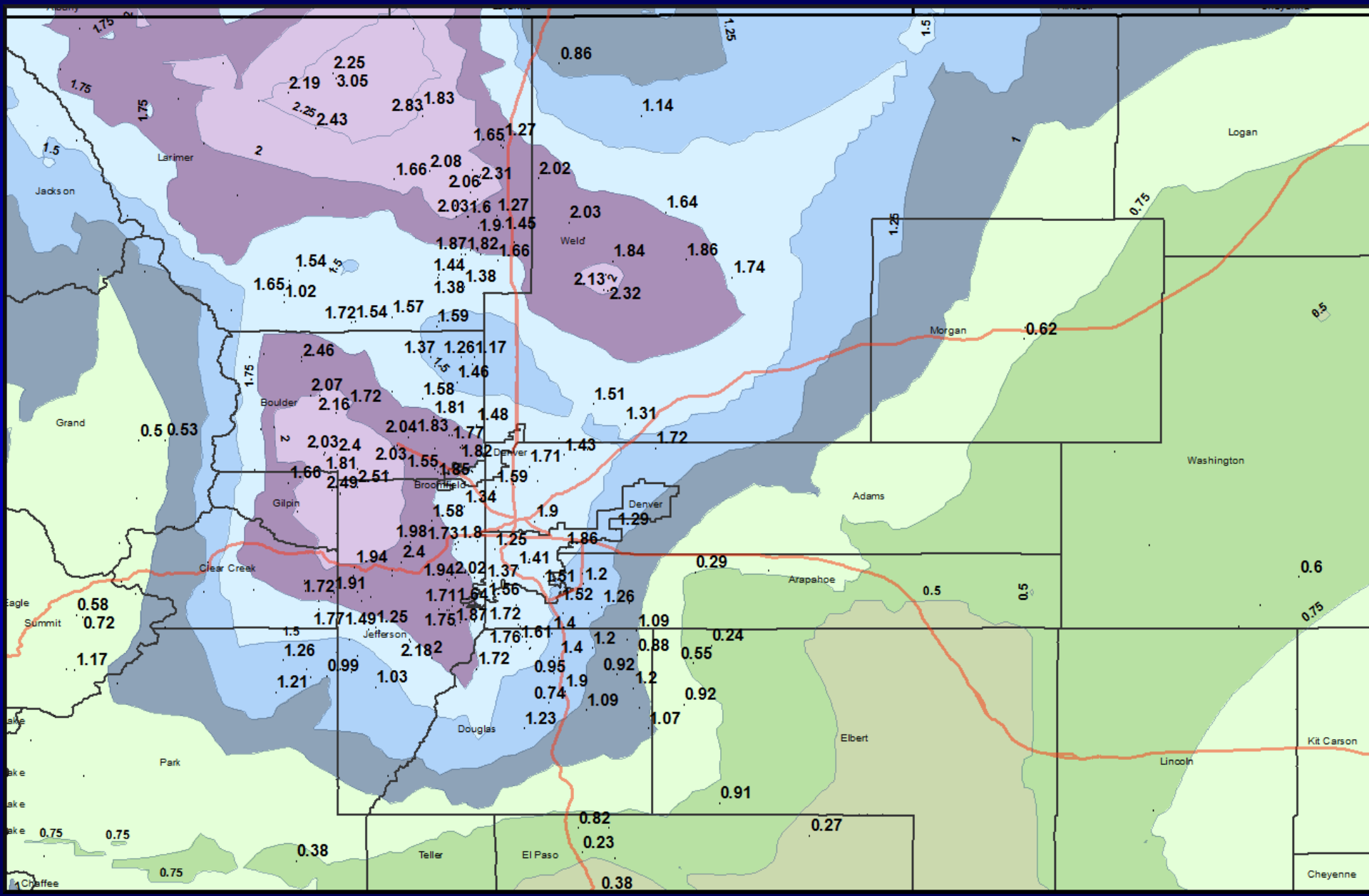
NC & NE Colorado Snowfall Map – May 10-12, 2014

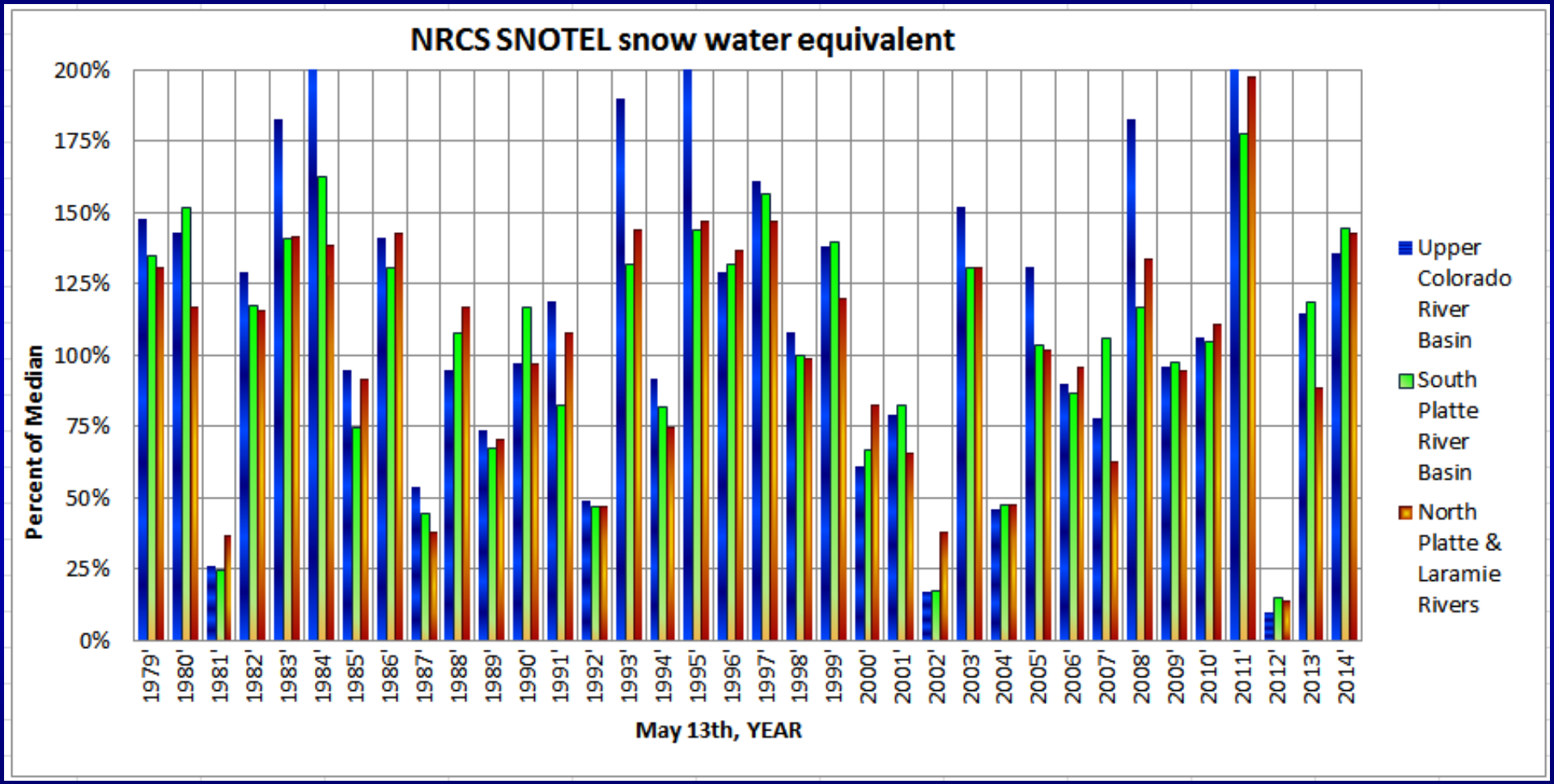


NC & NE Colorado Precipitation Map – May 10-12, 2014

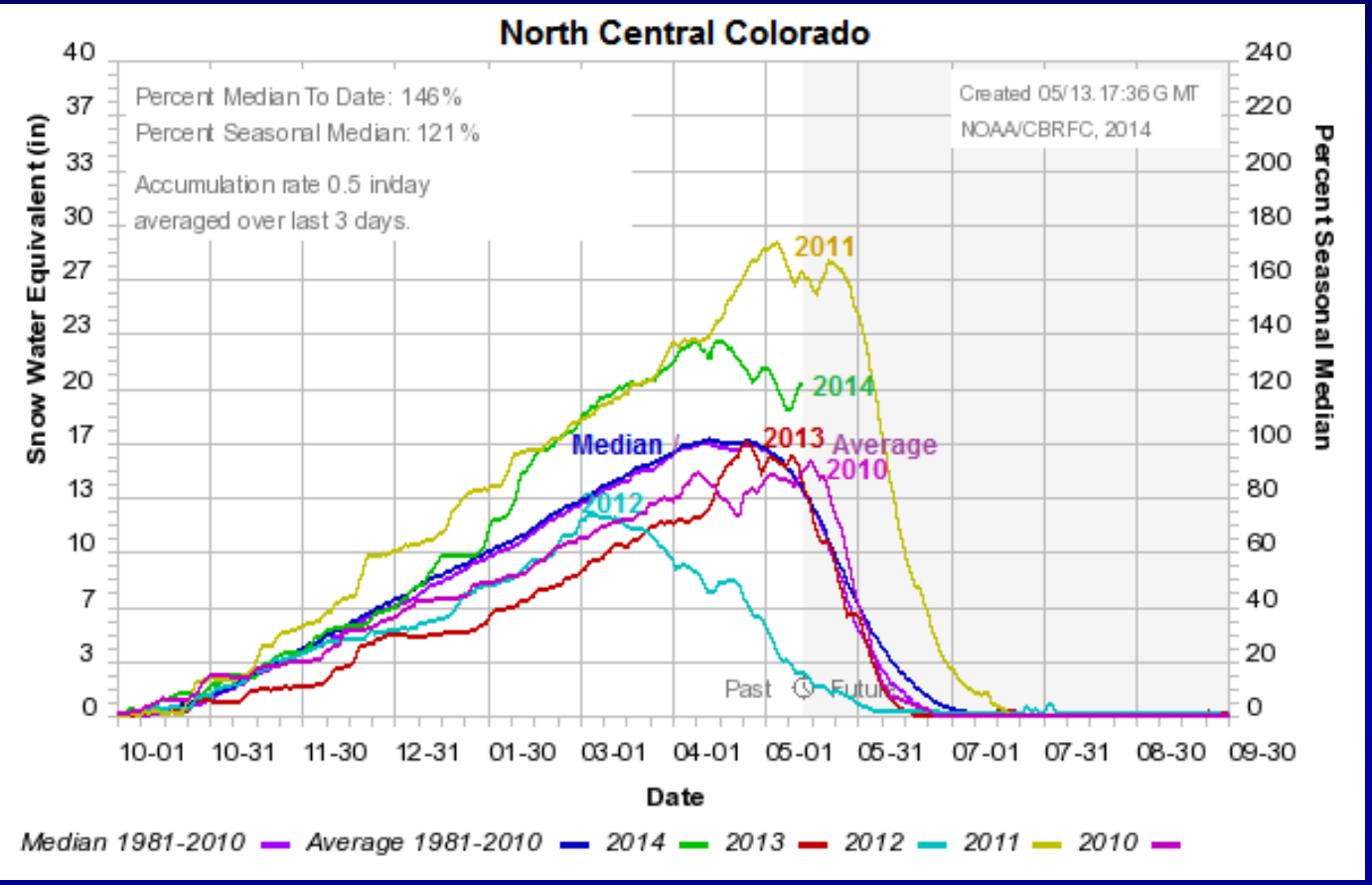


- The winter storm May 10th – 12th brought significant snowfall to sections of the north central mountains.
- On one hand the cooler temperatures slowed the snowmelt runoff.
- On the other, the mountain snowpack in the South Platte River basin increased from 121% of average on May 8th, 2014 to 145% of average by May 13th, 2014.
- In the upper Colorado River Basin the snowpack rose from 104% of average on May 8th, 2014 to 136% of average by May 13th, 2014.
- Now there is additional snowpack that needs to run off. The peak snowmelt runoff typically occurs between now and mid-June.

- The 2014 mountain snowpack is one of the 10 highest May 13th snowpacks during the past 35 years in both the South Platte and North Platte River Basins.



Mountain Snowpack Timeseries Graph through May 13th, 2014
(each line is a year of mountain snowpack)



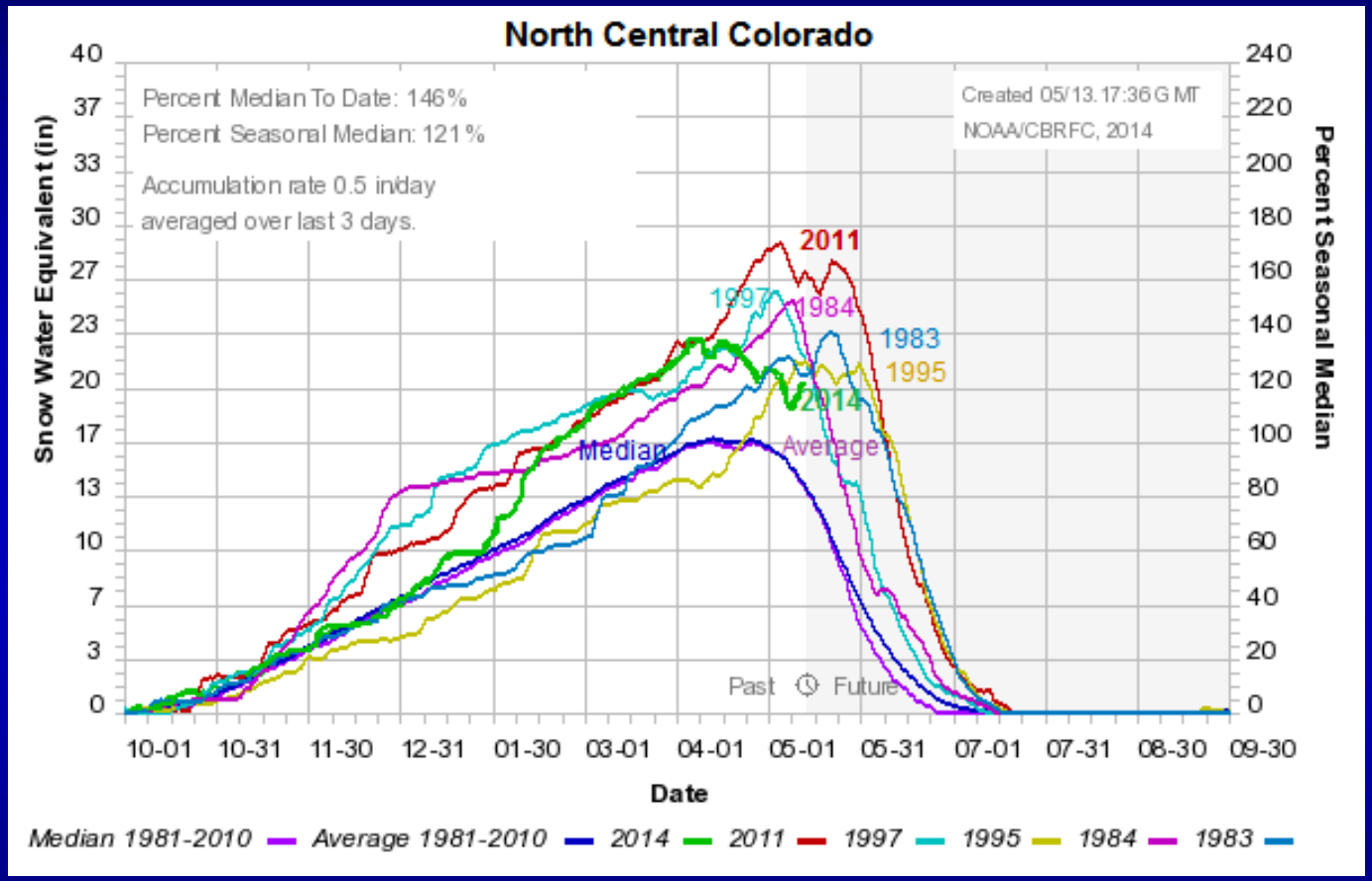
The May 13th, 2014 snowpack in the north central Colorado mountains was on the rise again, but remained well below the 2011 snowpack.

* SNOTEL data for this graph provided by the NRCS.

The green line on the time series graph shows the NRCS SNOTEL SWE (snow water equivalent in the snowpack) from October 2013 through mid-May 2014. The blue/violet lines show the 1981-2010 average/median.

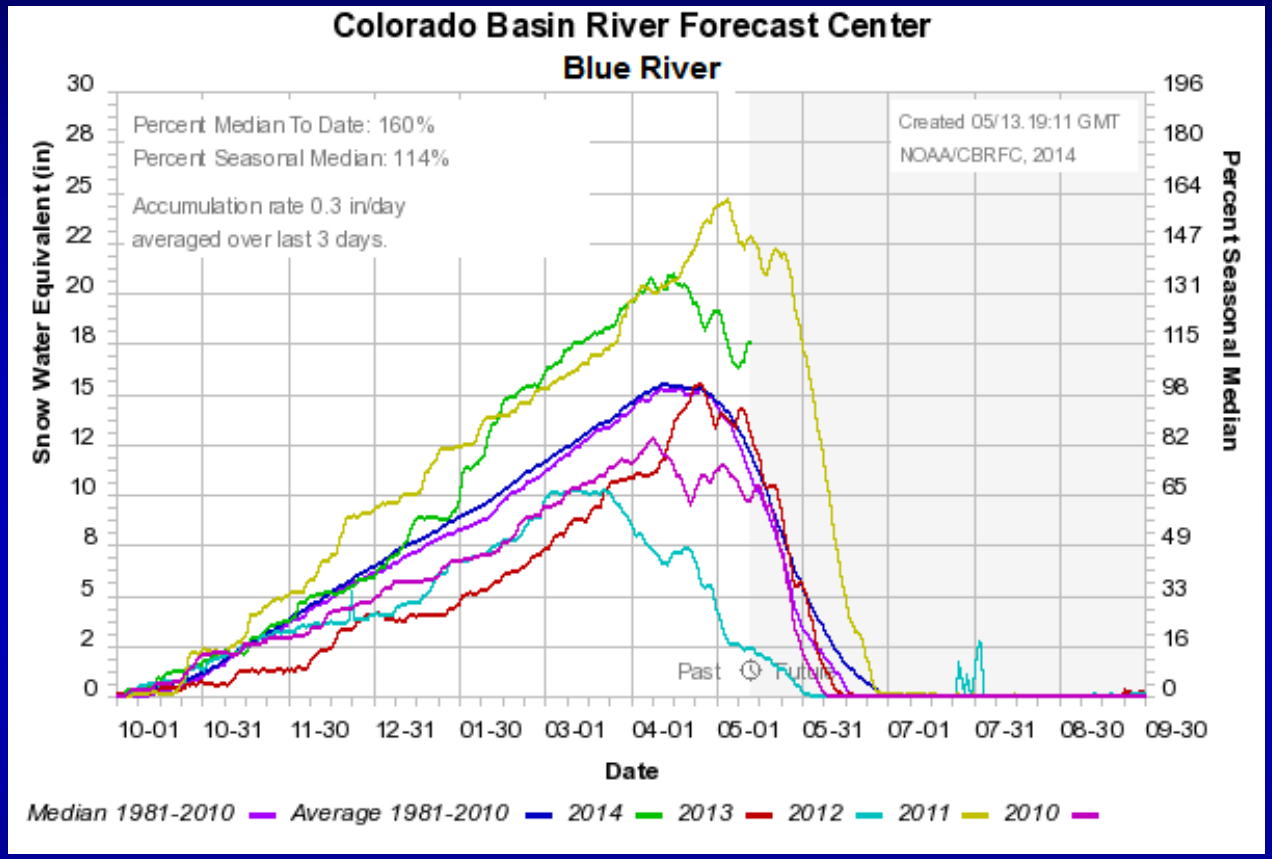
NC CO Mountain Snowpack Timeseries Graph

(6 of the highest percent of average snowpack years)

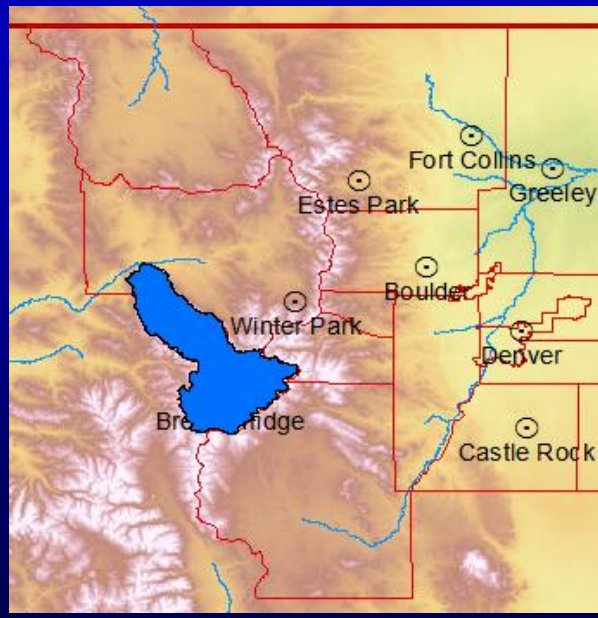


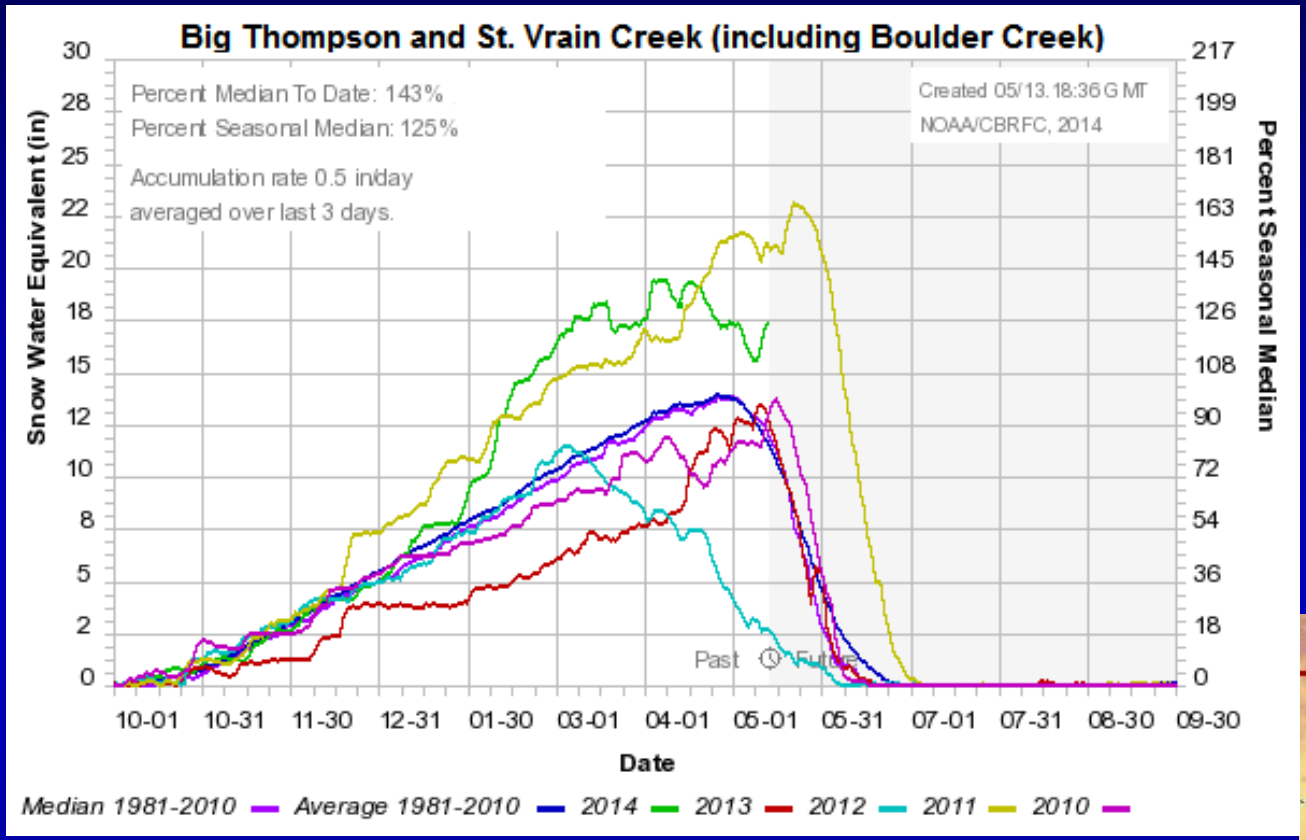
* SNOTEL data for this graph provided by the NRCS.

The past 5 years are displayed for sub-basins on the next 5 slides. The basins with the highest percent of normal snowpack are first.

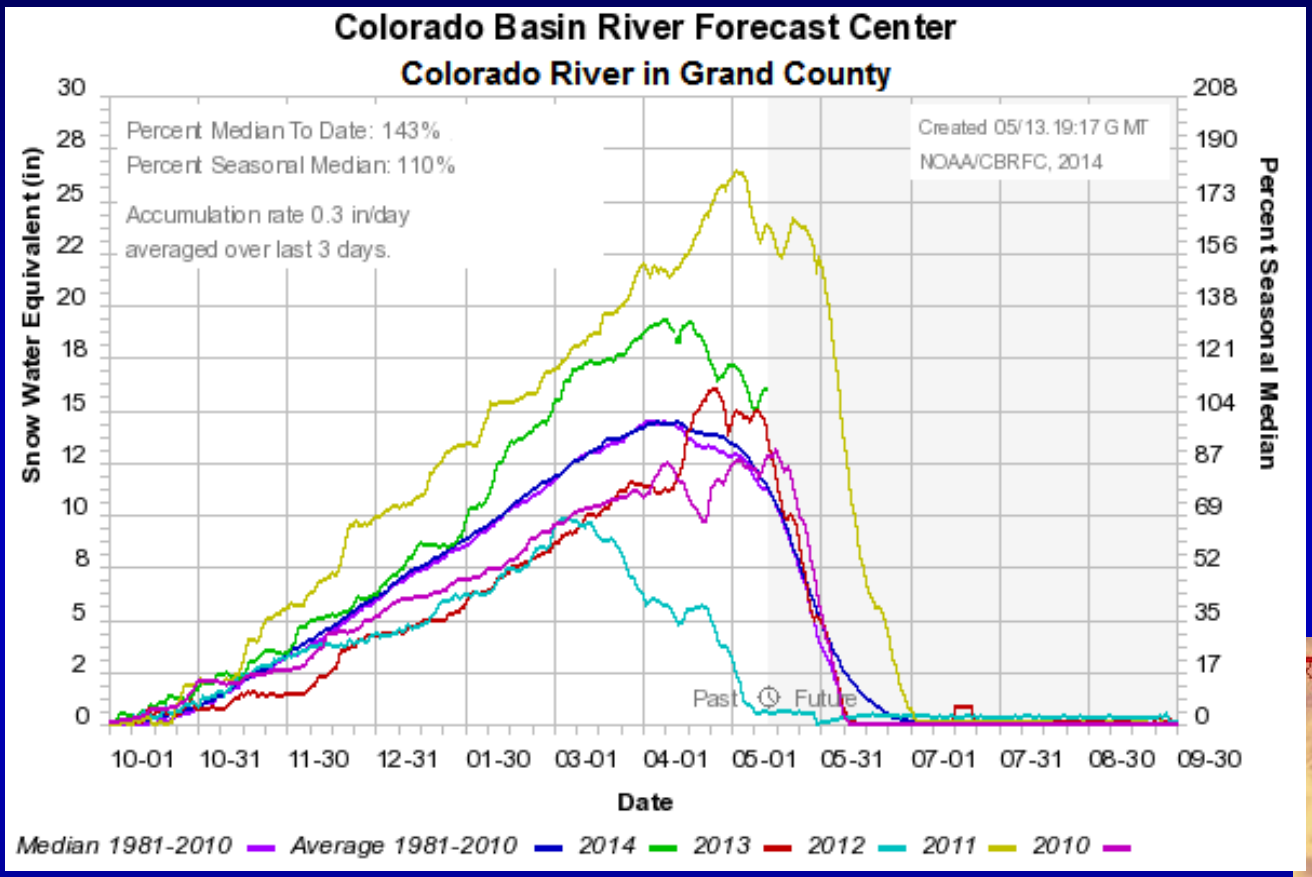


Summit County

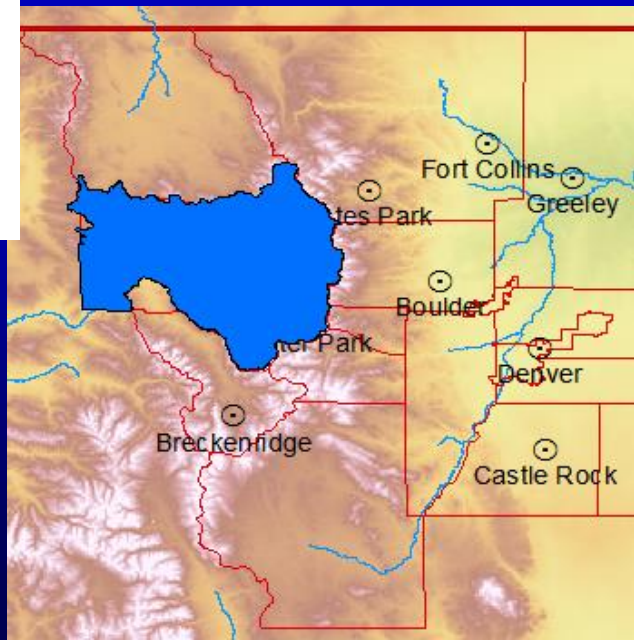


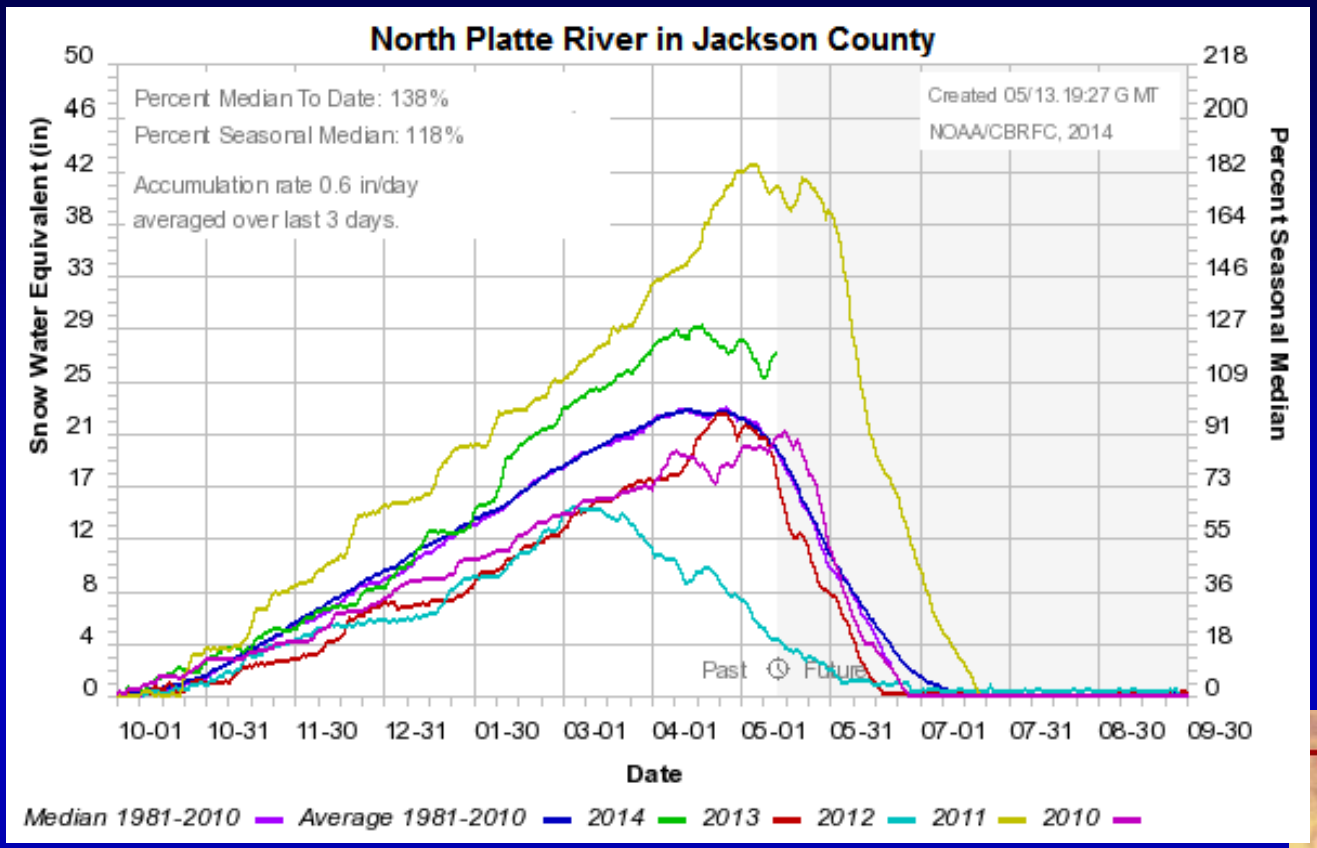


Boulder & southern Larimer Counties.

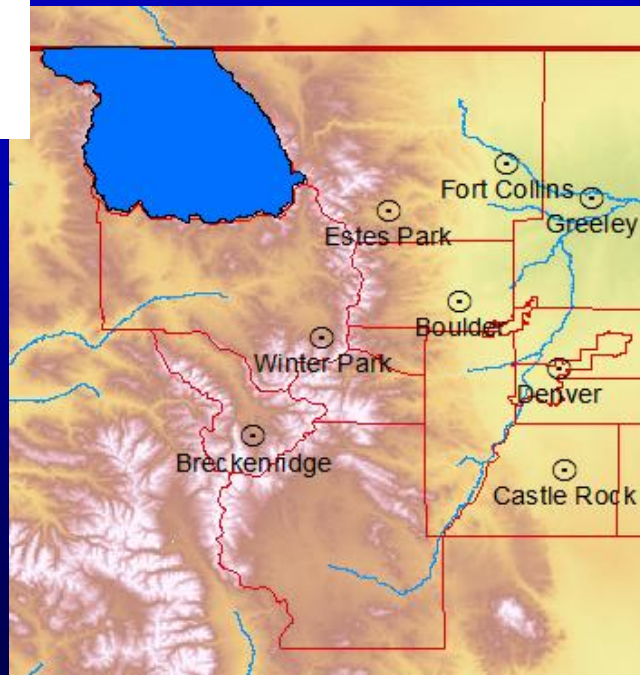


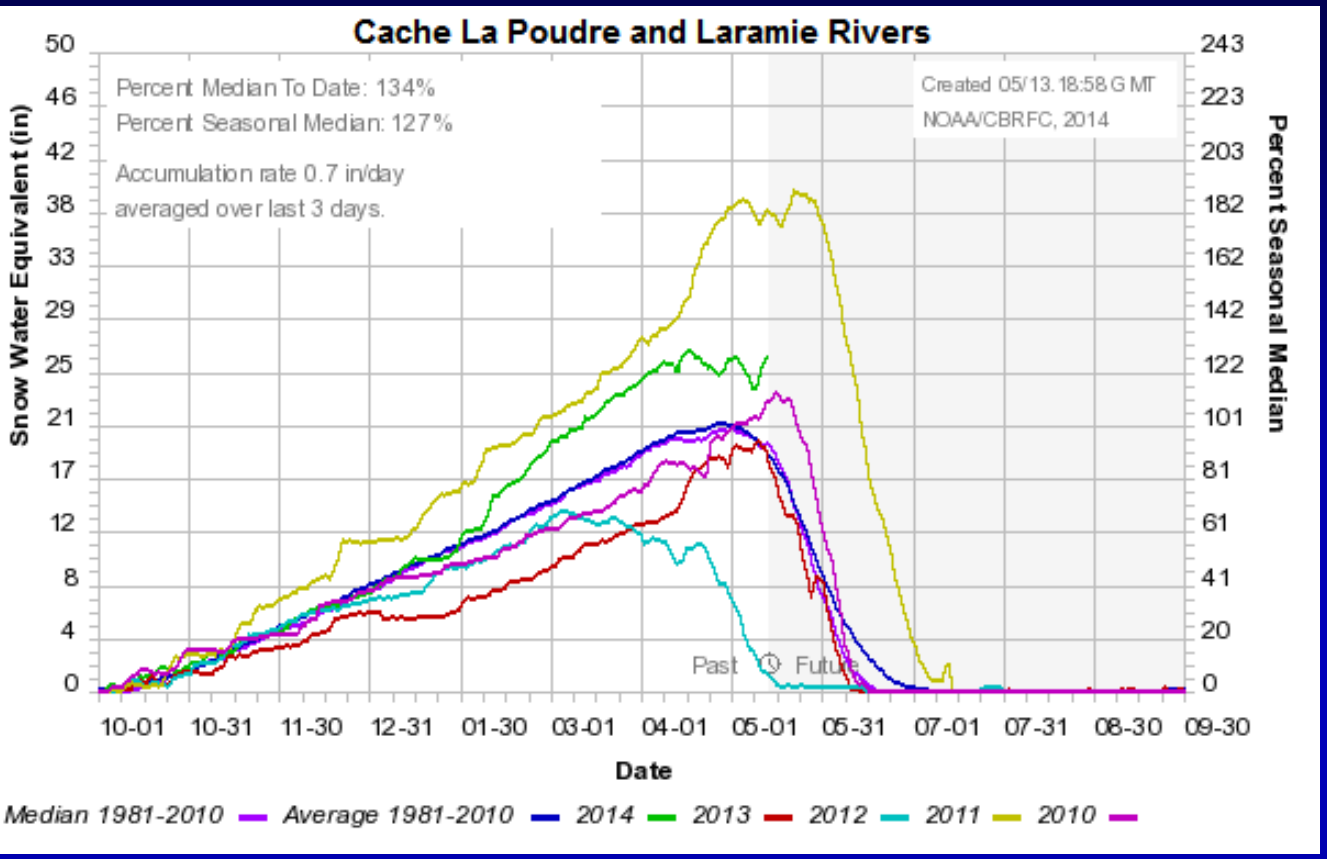
Grand County



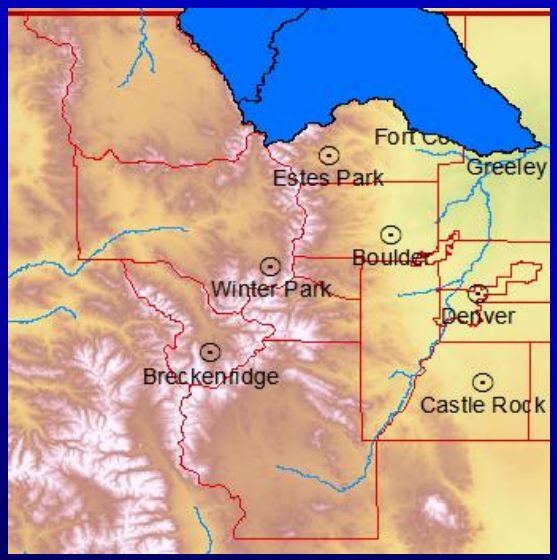


Jackson County.

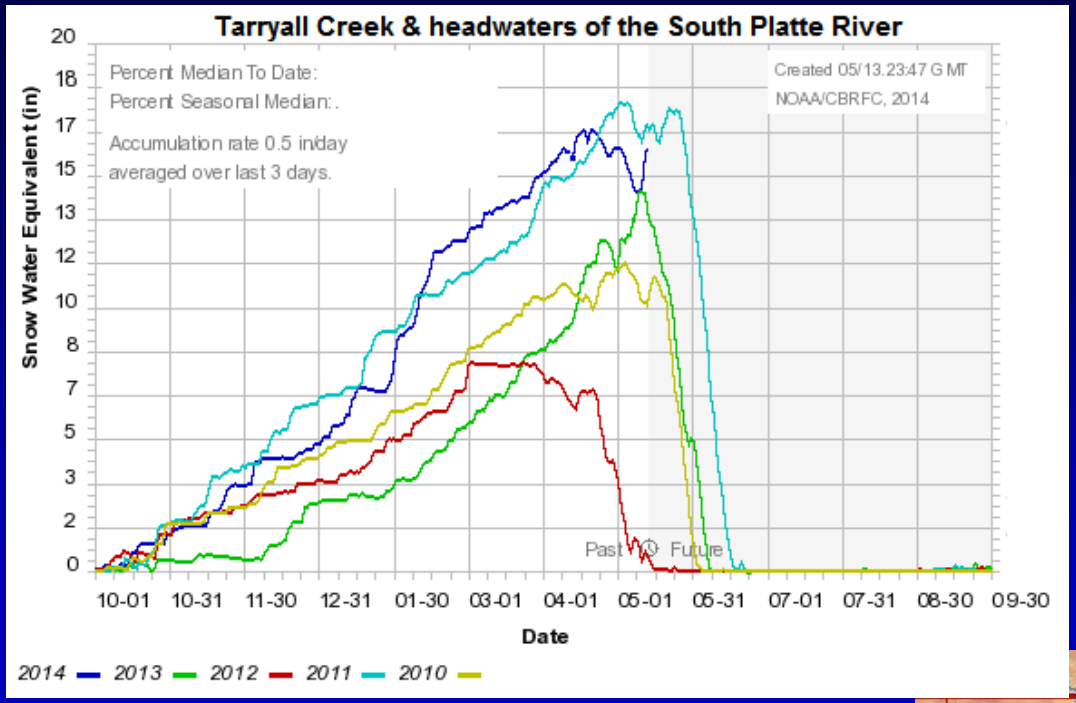




northern Larimer County.

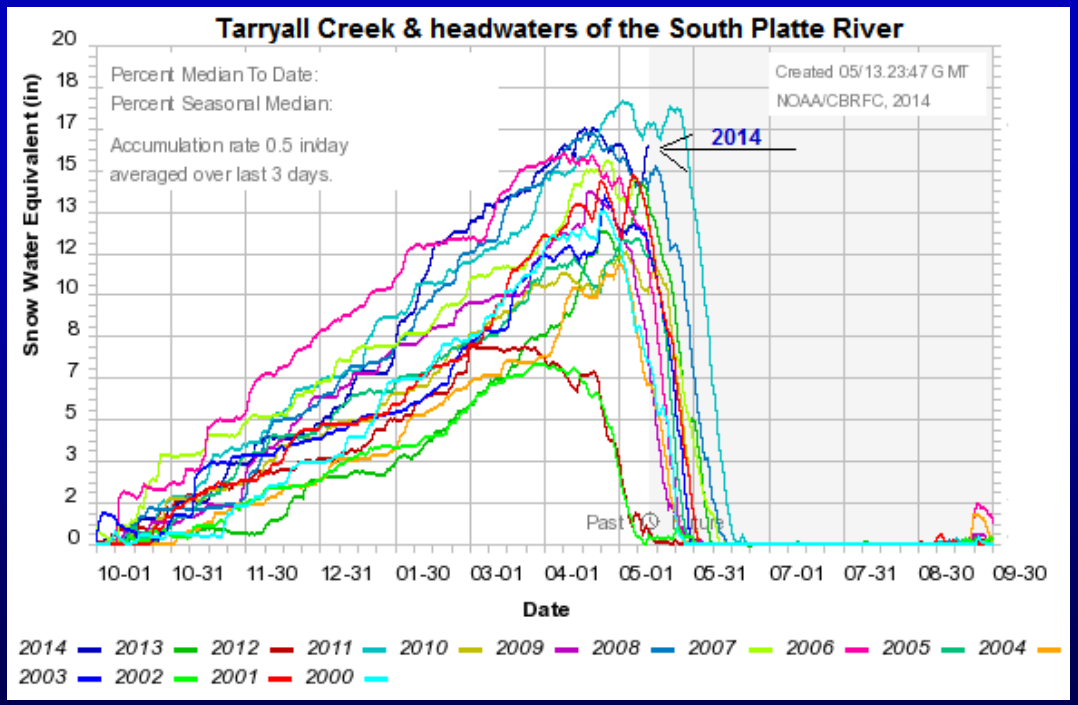


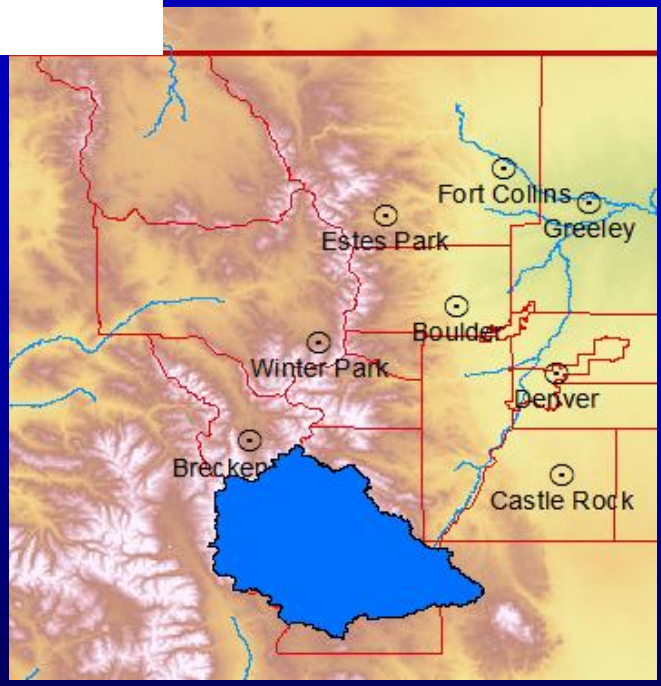
Past 5 years =>



Average/median data was not available for the next 2 slides.

Park County.

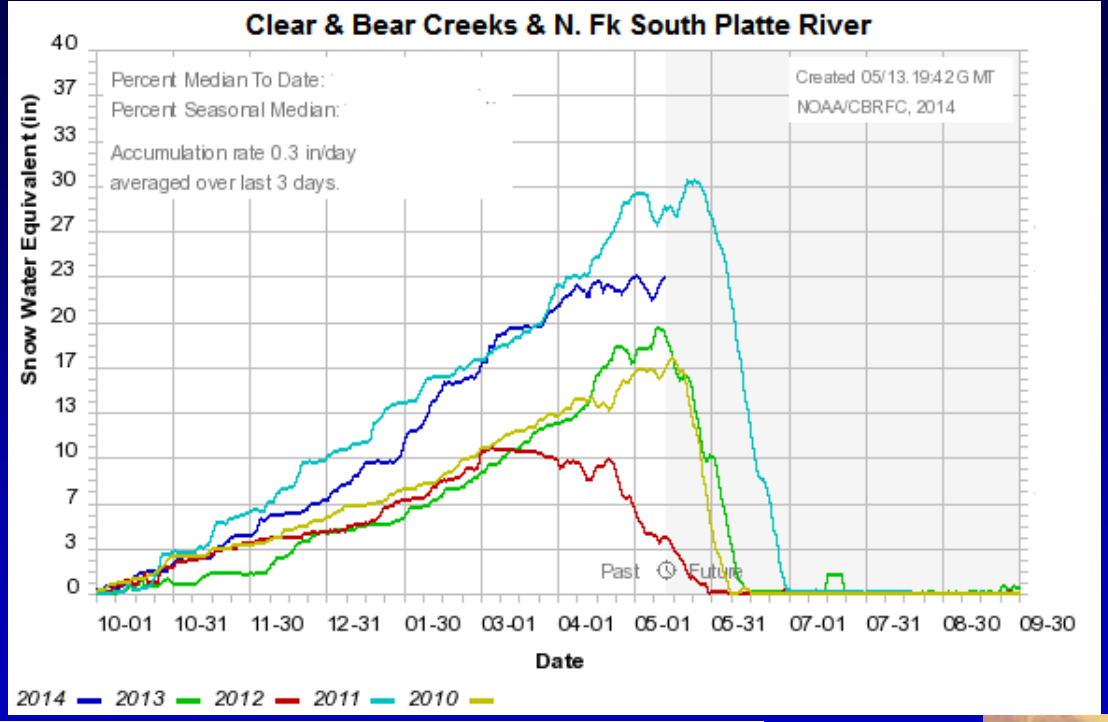




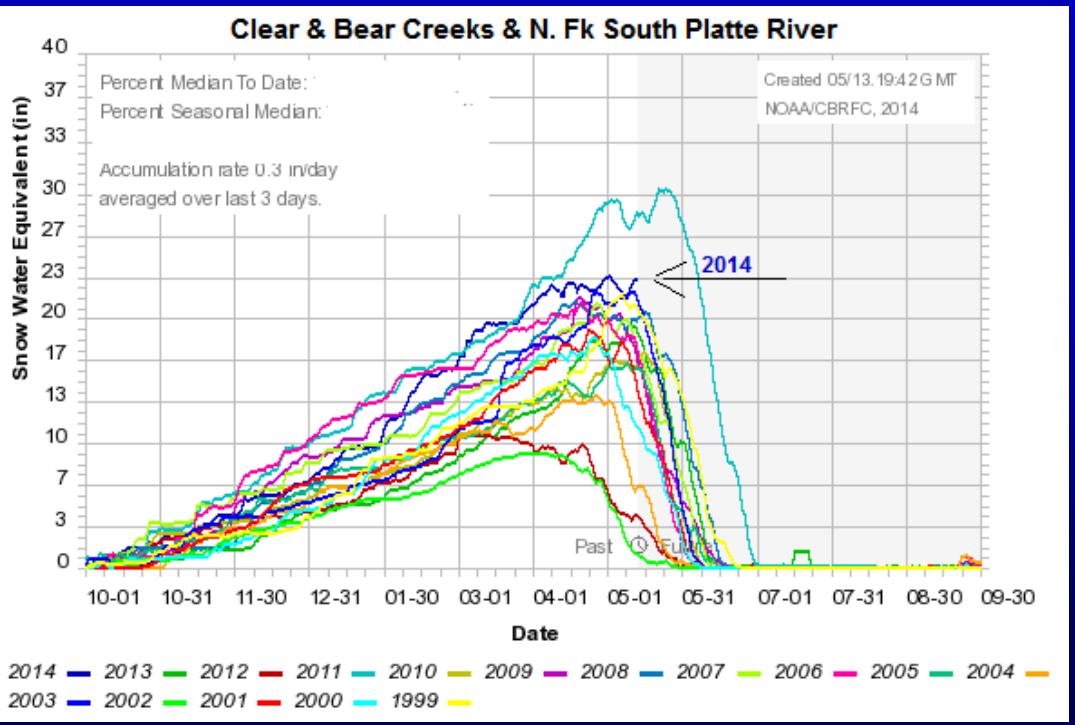
←**Past 15 years**

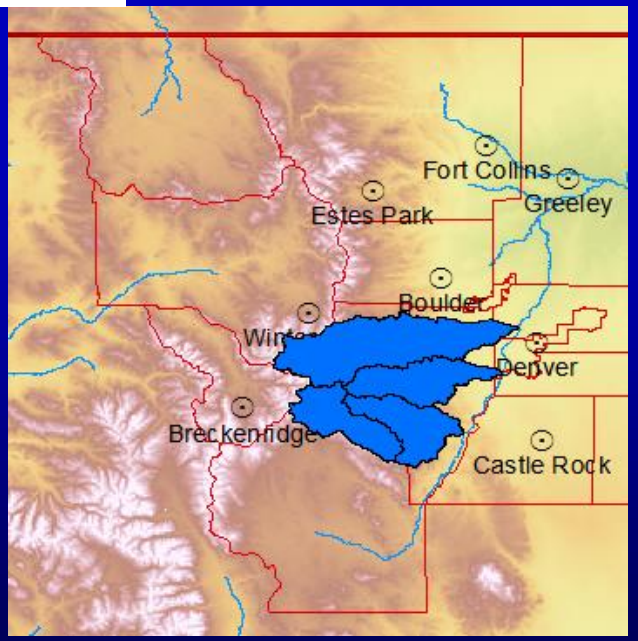
Past 5 years

=>



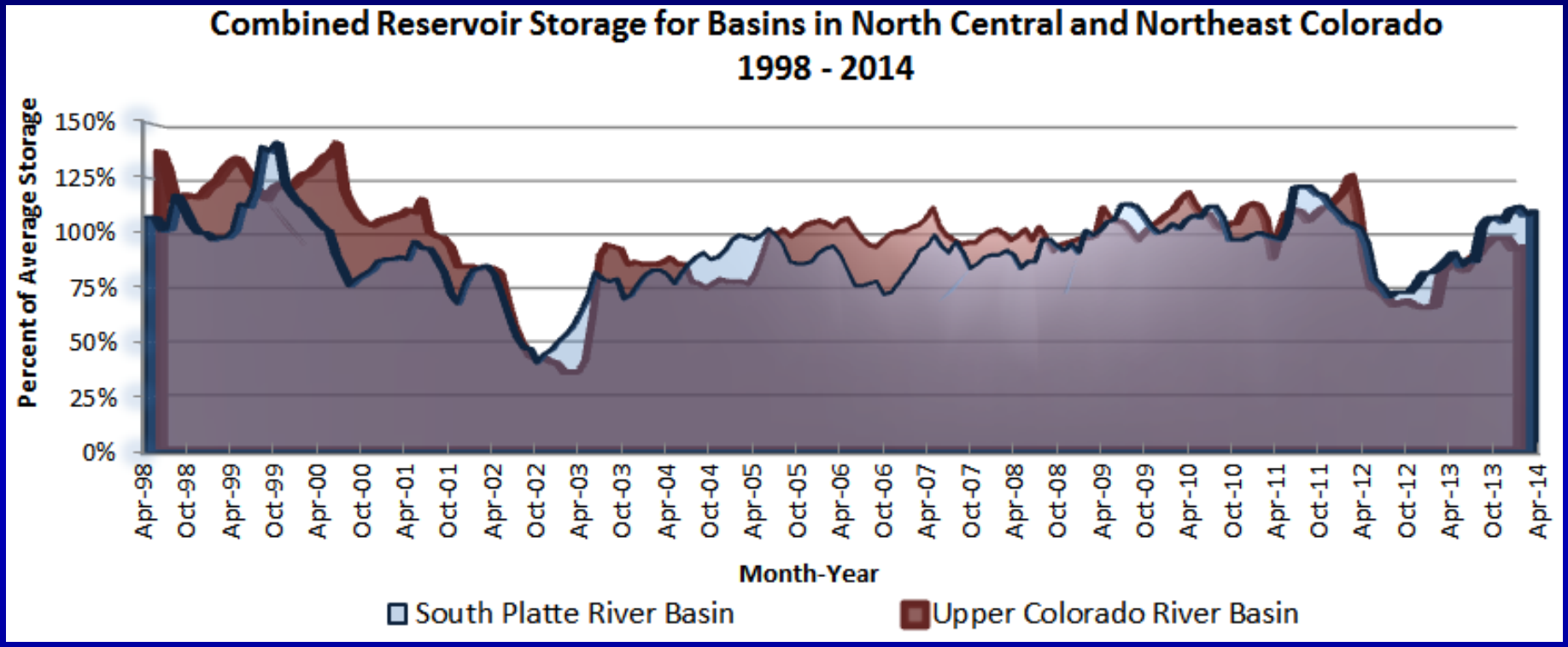
Clear, Jefferson & extreme NE Park Counties.





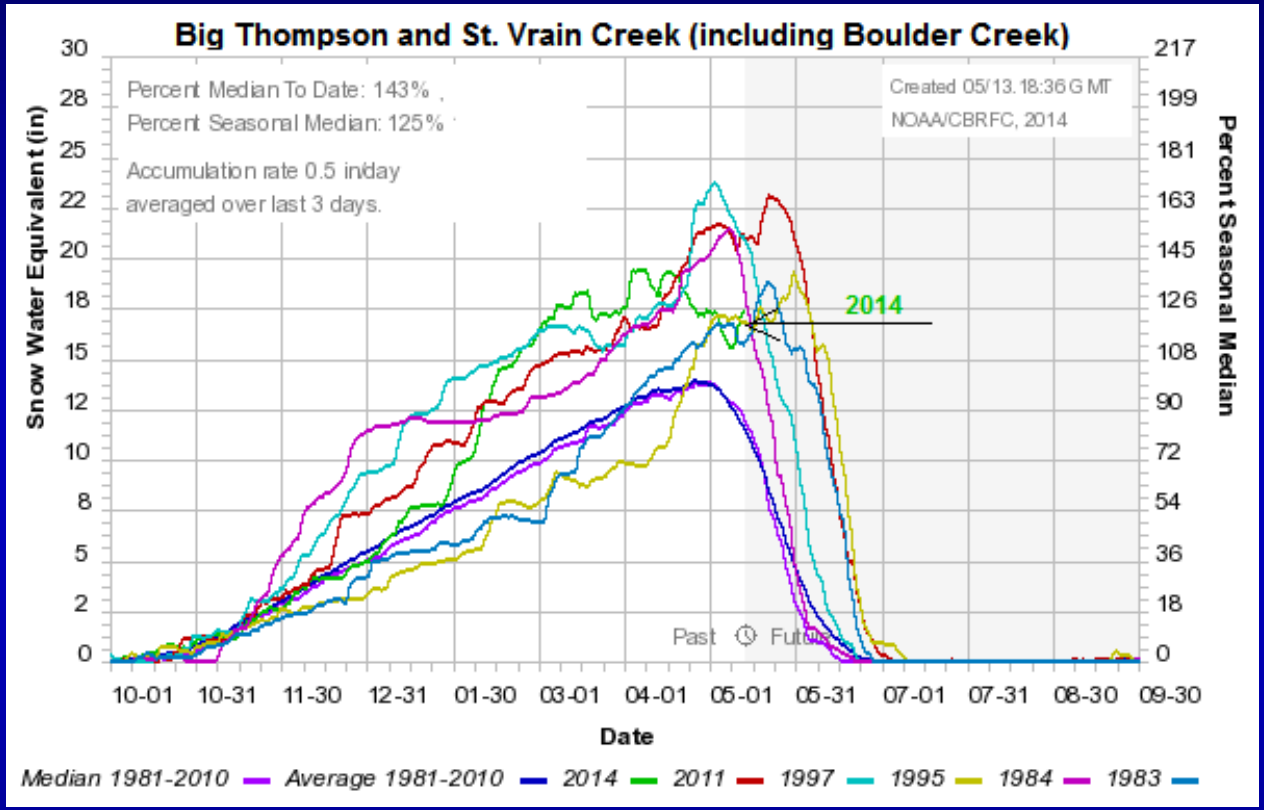
←Past 16 years

Reservoir Storage through the end of April 2014

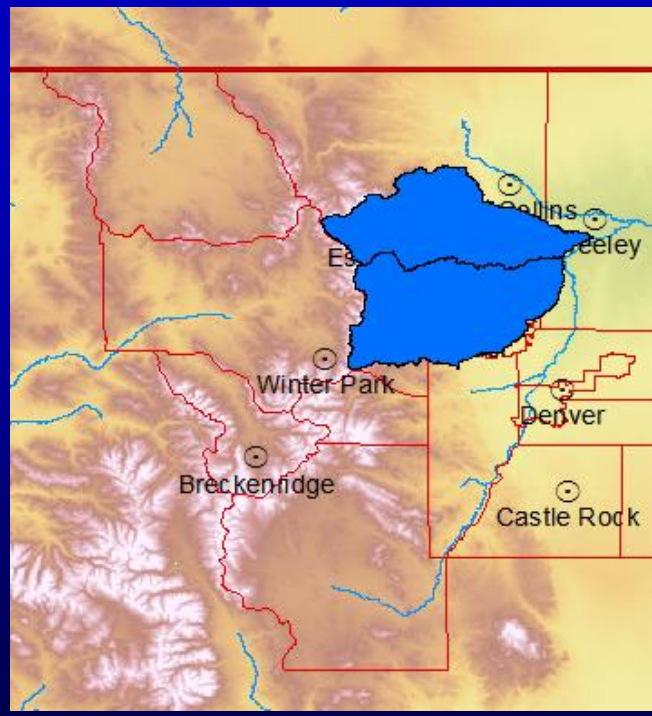


The graph shows the percent of average combined reservoir storage (which is currently around 120% to 150% of storage last year at the same time). The combined storage is around 90% of capacity in the South Platte Basin, and 57% of capacity in the Upper Colorado River.

- Although the snowpack is not as high as in May 1984, 1997 and 2011; the September floods have brought an increased risk of flooding to the Big Thompson, St. Vrain Creek, and Boulder Creek drainages.



- The time series graph above compares water year 2014 with highest recent snowpack years.



The September 2013 flood was a hydrologic event (flooding & streams changing their channels), a geologic event (sedimentation & landslides), and a hydrogeologic event (high water table). All of the antecedent conditions for another flood are here:

Due to last September's rain and flooding; the risk of flooding and flash flooding is higher this year primarily in the Front Range Foothills extending into the urban corridor in Boulder, Larimer, SW Weld and extreme Nrn Jefferson Counties.

- A small amount of water could start moving large quantities of sediment in affected streams.
- There are reduced creek and river capacities due to the increased sedimentation, rocky debris and stream bank erosion.
- Debris flows and landslides may cause access issues and obstruct creek flows.
- Woody debris along streams could potentially cause debris dams and subsequent flooding.
- Altered locations and conditions of streams may impact structures and infrastructures at risk.
- Some reservoirs in these areas are at or near capacity and will spill earlier than usual causing additional flow during the runoff and thunderstorm season.

Risks from the Boulder Office of Emergency Management: Post-Flood Community Preparedness Guide - Flash Flood, Landslide and Debris Flow 2014 Edition

Other Issues:

High groundwater:

- The water table is high particularly in areas severely impacted by the September 2013 rains. High groundwater and saturated soils will cause more runoff and higher streamflows.

Landslides:

- The September 2013 rains destabilized hillsides and steep slopes . High groundwater can be a trigger for deep cut landslides. Increased landslides and rock slides will be possible this spring, particularly with heavier and/or prolonged rainfall.

Some Factors than will impact the mountain snowmelt:

- **Future snowfall**
- **Stream levels during the melt**
- **When and how fast the snow melts (freezing and thawing in the mountains)**
- **Future rainfall amounts and timing**
- **Whether rain (especially a warm rain) falls on the snowpack**
- **Groundwater/soil moisture**
- **Dry winds**

Examples: In the spring of 2010 the snowpack was near average, but heavier spring rains fell during the spring runoff causing localized minor flood issues. In the spring of 2011 there were concerns due to the high snowpack. However, the snow melted out in an orderly fashion with no major flood issues (although the flooding in the spring of 2011 was more widespread compared with the spring of 2010).

Before a flood:

- Create a Communications Plan - It is important to be able to communicate with your family and friends in the event of a disaster. Whether it is having a specific person identified to contact for status updates or a safe location to meet up with family members, having a plan in place will give you peace of mind if disaster does strike.
- Prepare your Family & Pets – Planning can help you and your family evacuate faster. Also, have a plan for your pets so you won't be delayed in the danger zone. Don't wait until the last moment to gather the essentials for yourself, your family and/or your pets.
- Plan to Go to a Safe Location – Identify locations located at higher ground in case of flooding. Know more than one way to get to your safe locations on foot if necessary.
- Assemble an Emergency Kit - It is good practice to have enough food, water and medicine on hand at all times to last you at least 3 days in the case of an emergency. Water service may be interrupted or unsafe to drink and food requiring little cooking and no refrigeration may be needed if electric power is interrupted. You should also have batteries, blankets, flashlights, first aid kit, rubber boots, rubber gloves, and a NOAA Weather Radio or other battery operated radio easily available.
- Prepare Your Home - If you have access to sandbags or other materials, you may be able to use them to protect your home from flood waters if you have sufficient time to do so. Filling sandbags can take more time than you may think.